AMP1-16-M

1RU, 16-Channel, 3G/HD/SD-SDI Audio Monitor

User Guide
(Software Release: 2.2x)

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Wohler CONFIDENCE.
VIDEO AUDIO CAPTIONING LOUDNESS
31055 Huntwood Avenue
Hayward, California
94544 USA
1 800 5 WOHLER
+1 (510) 870-0810
Fax +1 (510) 870-0811
www.wohler.com
info@wohler.com

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Customer Support

Wohler Technologies, Inc.
31055 Huntwood Avenue
Hayward, CA 94544
www.wohler.com

Phone: 510-870-0810
FAX: 510-870-0811
US Toll Free: 1-888-596-4537
(1-888-5-WOHLER)
Web: www.wohler.com
Sales: sales@wohler.com
Support: support@wohler.com

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CHAPTER 1
Quick Start

Introduction

Overview

The AMP1-16-M is a 1RU, 16-channel, 3G/HD/SD-SDI audio monitor. This unit comes with two 2.4" graphics screens that work together to display 16 channels of audio level metering. You can both visibly and audibly monitor any de-embedded channel pair or pairs of the selected 3G/HD/SD-SDI input signal. The AMP1-16-M is small, low-cost, and simple to operate. Configuration is simple and you can easily copy any configuration to other AMP1-16-M units.

Note that very little configuration should be necessary. We have already configured the unit to the most commonly requested settings. However, should you need to change these settings, you can access the unit either through the front panel menu system, or remotely through a PC graphical user interface (GUI).

Topics

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Safety

Instructions

1. Read, keep, and follow all of these instructions; heed all warnings.
2. Do not use this equipment near water.
3. Use only a dry cloth to clean the equipment.
4. Do not block any ventilation openings.
5. Do not install near any heat source such as a radiator, heat register, amplifier, or stove.
6. Do not attempt to plug the unit into a two-blade outlet (with only two prongs of equal width).

IMPORTANT: By design, this monitor will only plug into a three-prong outlet for your safety. If the plug does not fit into your outlet, contact an electrician to replace the obsolete outlet.

7. Protect the power cord from being walked on or pinched, particularly at plug's source on the equipment and at the socket.
8. Use only the attachments/accessories specified by the manufacturer.
9. Unplug the equipment during lightning storms or when unused for long periods of time.
10. Refer all servicing to qualified service personnel. Servicing will be required under all of the following conditions:
    - The equipment has been damaged in any way, such as when the power-supply cord or plug is damaged.
    - Liquid had been spilled or objects have fallen onto the equipment.
    - The equipment has been exposed to rain or moisture.
    - The equipment does not operate normally.
    - The equipment has been dropped.

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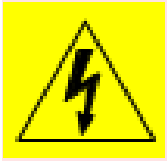
Safety Symbols

WARNING:



The symbol to the left warns of electric shock hazard inside the unit. Disconnect the power cord before removing access panels when installing upgrades. Only qualified service personnel are to operate the equipment with covers removed, and are to exercise caution to avoid personal injury.

Mounting

The unit is designed to install into a standard 19" rack mounted at ear level for best high frequency response and visual observation of the display screen. Please adhere to the following clearances:

Clearance	Surface
24″	Front
3″	Rear
2″	Sides
1.75″	Top and Bottom (if either radiates heat)
0″	Top and Bottom (if no heat)

Heat Dissipation

The ambient temperature inside the mounting enclosure should not exceed 40° Celsius (104° Fahrenheit). Adjacent devices can be rack mounted (or stacked) in proximity to the unit if this temperature is not exceeded. Otherwise, allow a 1RU (1.75″/44.45mm) space above and below the unit for air circulation.

Important: To reduce noise, the monitor does not have any fans. As a result, the heat generated by the class D power amplifiers, power supplies, and other components is vented by slots in the sides and back of the unit. Therefore, as a safety precaution, you must allow proper ventilation on these surfaces.

Sympathetic Vibration

Sympathetic vibration from other equipment (cables, etc.,) in the rack may be serious enough to interfere with the unit's sound quality. The use of thin card stock and/or felt or foam weather-stripping type

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materials between adjacent vibrating surfaces, or tying up loose cables, etc., may be required to stop vibrations external to the unit.

Mechanical Bracing

The 1RU chassis is securely attached to the front panel. In addition, the chassis has mounting tabs through which you attach it to the rack rail. This feature will reduce or eliminate rear bracing requirements in many mobile/portable applications. The weight of internal components is distributed fairly evenly around the unit.

Electrical Interference

Be careful to avoid mismatched cable types and other similar causes of undesired reflections in digital signal systems. If severe enough, such reflections can result in corruption of the digital data stream. As with any audio equipment, maximum immunity from electrical interference requires the use of shielded cable; however, satisfactory results can sometimes be obtained without it. The internal circuitry ground is connected to the chassis.

Power

The unit comes with a standard internal power supply and connects an A/C mains power source (60W, 100 to 240 VAC, ±10%, 50/60Hz) through the IEC connector provided on the rear panel of the unit.

When the mains plug or appliance coupler is used as the disconnect device, the disconnect device should remain operable.

Compliance

FCC

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio

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frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

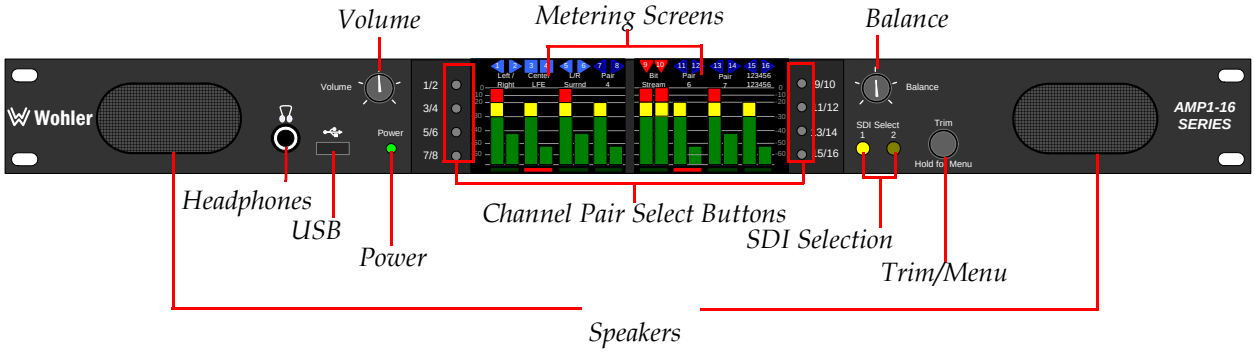
IC-ECES-003

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Front Panel

Figure 1–1 Front Panel Layout



- **Speakers:** Audio monitoring is achieved through the use of class D amplifiers driving two (left/right) wide range speakers.
- **Headphone Jack (1/4"):** A 1/4" jack for an optional headphone is provided on the front panel.
- **USB 2.0 Port**: (Future Software Release) This USB Type A connector allows you to use a flash drive (not supplied) to copy system configurations to another AMP1-16-M or to a PC.
- **Volume:** The left knob controls the **Volume** of the internal speakers, headphones, and optionally of the rear panel balanced analog outputs. This control can be set so that it only controls the **Left Volume**.

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- **Power Indicator**: This tri-color LED indicates power and basic status information. See Table 1–1 below.

Table 1–1 Power Color / Indication Descriptions

LED Color	Description
Green	The AMP1-16-M is functioning normally.
Red	When the LED flashes green or yellow followed by a series of red flashes, each flash sequence indicates an error code. Try restarting the unit, and if the problem persists, contact Wohler Technical Support.
Yellow	The LED is also a solid yellow when it is booting. The LED blinks yellow when a firmware update is in progress.
Off	The AMP1-16-M is not receiving AC power.

- **Metering:** These screens work together to display bar graphs and the configuration menus.

- **Channel Pair Select Buttons:** These eight buttons allow you to select the audio channel pair or pairs to be monitored. They are also used in conjunction with the internal menu system.

- **Balance**: The right knob adjusts the **Balance** between the speakers and optionally between the rear panel balanced analog outputs. This control can be set so that it only controls the **Right Volume**.

- **SDI Selection**: Press either of these LED buttons to select one of the two SDI inputs. Note that **SDI 1** is selected by default whenever:

  A. The AMP1-16-M is powered up,

  B. A preset is recalled locally or remotely, or

  C. The **Send to Unit** control is clicked on a remote access.

- **Trim/Menu**: Pressing and holding this button for approximately three seconds opens the menu system so you can customize the operation of the AMP1-16-M.

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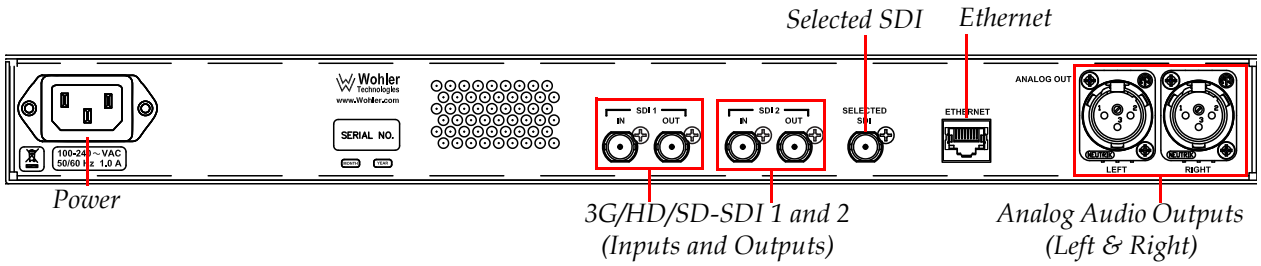
Rear Panel

Figure 1–2 Rear Panel Layout



- **Power:** The AMP1-16-M uses a standard IEC power cord for the 100 to 240 VAC ±10%, 50/60 Hz power connection.
- **3G/HD/SD-SDI Inputs:** These two BNC connectors accept the 3G/HD/SD-SDI input signals.
- **3G/HD/SD-SDI Outputs:** These BNC connectors output regenerated replicas of the two 3G/HD/SD-SDI input signals.
- **Selected 3G/HD/SD-SDI Re-Clocked Output:** This BNC connector re-clocks the selected 3G/HD/SD-SDI input signal.
- **Ethernet:** The Ethernet port can connect to either a LAN or a PC to let you customize the AMP1-16-M configuration. It will also allow you to copy configurations from one AMP1-16-M to another. Lastly, it can be used to update the AMP1-16-M software and firmware. Refer to Chapter 3, Appendix A, and Appendix B for details.
- **Analog Outputs:** These XLR connectors provide two channels of balanced analog outputs. The source of these signals is the mix of audio monitored by the internal speakers.

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CHAPTER 2
Operation

Introduction

Overview

This chapter describes how to operate the AMP1-16-M.

Topics

Topics	Page
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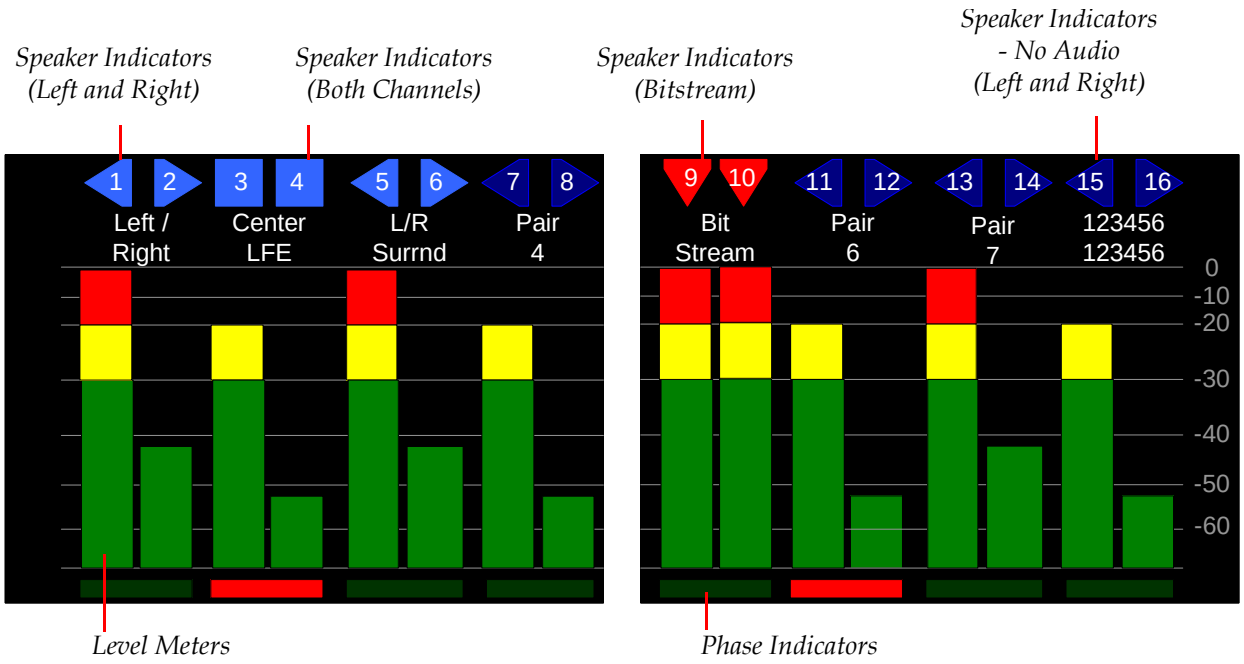
Main Screen

After powering up the AMP1-16-M and connecting an SDI input, you should see the **Main Screen**, which will be similar to the one shown in Figure 2–1 below.

Figure 2–1 Main Screen



- **Speaker Indicators**: The indicators above each meter identify the channel number and the status of the channel.

Table 2–1 Channel Icon Descriptions

Attribute	Symbol	Description	Meaning
Icon Shape	1	Left Pointing Blue Triangle	Channel configured to sound in the left speaker
	2	Right Pointing Blue Triangle	Channel configured to sound in the right speaker
	3	Blue Square	Channel configured to sound in both speakers

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Table 2–1 Channel Icon Descriptions (Continued)

Attribute	Symbol	Description	Meaning
Icon Color		Light Blue Triangle or Square	Channel is selected by the **Channel Pair Select** buttons and can be heard
		Dark Blue Triangle or Square	Channel is not selected by the **Channel Pair Select** buttons and cannot be heard
		Downward Pointing Red Triangle	Channel contains a bitstream instead of audio and cannot be heard

- **Level Meters**: All of the channels are metered. To listen to any pair or pairs, press the **Channel Select** button associated with each numbered pair. Press again to deselect a channel pair. The selected pairs will be summed to the speakers as indicated by lit light blue channel indicators.

  Adjust the **Volume** and **Balance** controls as necessary.

  The channel pairs can be given unique names. To do this, simply connect a PC to the Ethernet port and run the AMP1-16-M GUI setup program. Refer to Appendix A on page 43.

  To select the channels that go to each speaker, either connect a PC to the Ethernet port or open the self-contained menu system. To enter or exit the menu system, hold the **Trim** button for three seconds or more. In the menus, whether internal or in the AMP1-16-M PC setup program, you can set many other operating characteristics of the AMP1-16-M to your exact needs. Refer to Chapter 3 on page 15.

- **Phase Indicators**: When any of these indicators are red, they indicate that the odd/even pair is out of phase. Green indicates in phase. Refer to Options Menu on page 30 for more information.

Trim Screen

Press the **Trim** control to switch between the **Main Screen** and the **Trim Screen**. The **Trim Screen** lets you to individually adjust the gain of each channel to monitor the audio either through the internal speakers or through the analog outputs. The **Trim Screen** is shown in Figure 2–2 below.

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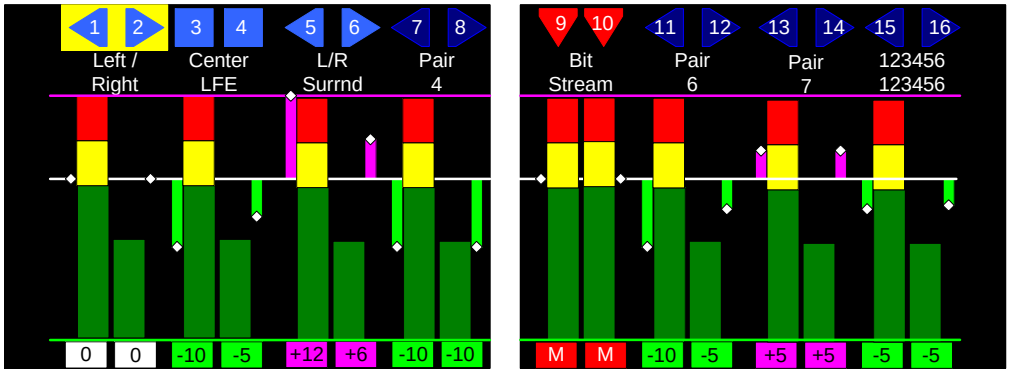
Figure 2–2 Trim Screen



The meters are labeled as they are in the **Main Screen**. At the bottom of each meter, a number indicates the amount of gain or loss being applied to each channel. If a gain is being applied, the number is indicated in a pink square. If a loss is being applied, the number is indicated in a green square. If no gain or loss is being applied, a zero is indicated in a white square. Adjacent to each meter, a small graphical indication appears, showing the gain or loss from +12 dB to -40 dB.

You can adjust a channel pair by pressing one of the eight **Channel Select** buttons to highlight the icons at the top of the meters and then turning the **Trim** knob to increase or decrease the gain. If the gain is decreased below -40 dB, the channel is muted and an **M** is shown in a red square.

Multiple channel pairs can be adjusted simultaneously by first selecting each one and then turning the **Trim** knob to adjust.

You can adjust an individual channel by repeatedly pressing the **Channel Select** button until only the channel you want to adjust is highlighted. Then turn the **Trim** knob to adjust it.

The settings in the **Audio Menu** and **Trim Menu** determine the trimmed adjustments that affect the internal monitor speakers, the analog outputs, both, or neither. You can also disable access to the **Trim Screen** if necessary in the **Trim Menu**. Refer to the Audio Menu on page 27 and the Trim Menu on page 28.

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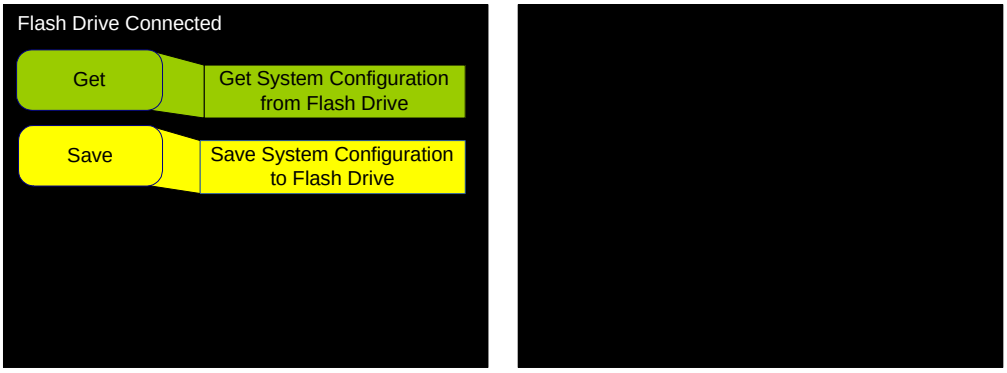
USB Port Functionality

You can copy configuration files to and from your unit by a flash drive connected to the USB port.

Note: To use the USB port from the PC GUI, refer to The USB Tab on page 22.

Immediately after connecting the flash drive to your AMP1-16-M, the **Flash Drive Connected** screen displays (interrupting any current functions except an Ethernet connection) as shown in Figure 2–3 below.

Figure 2–3 Flash Drive Connected Screen

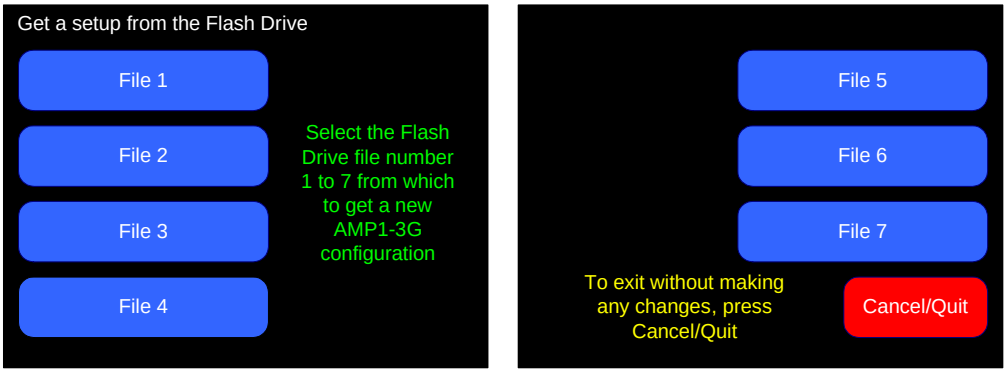


Note: All configuration files end in the .wcfg extension.

Copying a Configuration From the AMP1-16-M

1. To load a configuration file to the AMP1-16-M from your flash drive, press **Get**. The **Get a setup from the Flash Drive** screen will display as shown in Figure 2–4 below.

Figure 2–4 Get a Setup From the Flash Drive Screen


Get a setup from the Flash Drive
File 1
File 2
File 3
File 4
Select the Flash Drive file number 1 to 7 from which to get a new AMP1-3G configuration
File 5
File 6
File 7
To exit without making any changes, press Cancel/Quit
Cancel/Quit

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2. Press the file number (**File 1** through **File 7**)of the file you want to copy to your flash drive. Once the copy process completes, the **Flash Drive Connected** screen re-displays.

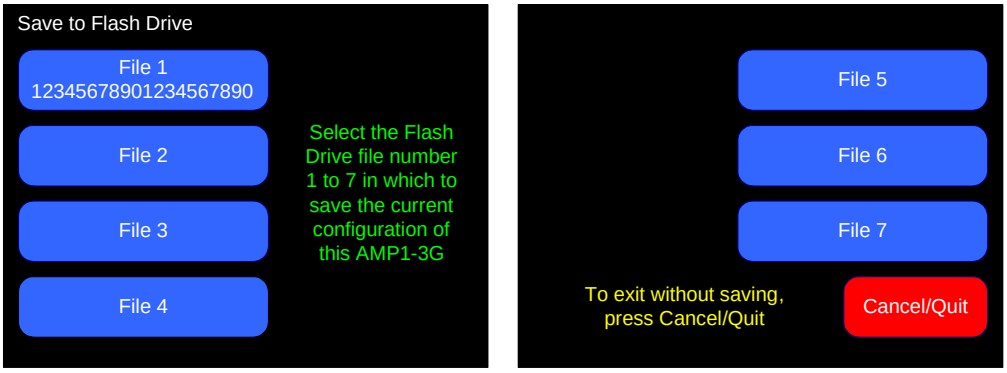
   Note: The configuration takes effect immediately when you press the **File** button.

3. Remove the flash drive from the USB port.

Copying a Configuration File from the AMP1-16-M

1. To copy a file to the flash drive from the AMP1-16-M, press **Save** from the **Flash Drive Connected** screen. The **Save to Flash Drive** screen will display as shown in Figure 2–5 on page 14.

Figure 2–5 Save to Flash Drive Screen



2. Press the file number (**File 1** through **File 7**) of the file you want to copy from your flash drive. Once the copy process completes, the **Flash Drive Connected** screen re-displays.

3. Remove the flash drive from the USB port.

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CHAPTER 3
AMP1-16-M Graphical User Interface (GUI) Manager

Introduction

Overview

This chapter describes how to use the AMP1-16-M Manager to the configure the AMP1-16-M.

Important: If you have not yet installed the AMP1-16-M Manager setup software into your PC and connected it to the AMP1-16-M, you **must** complete all the steps in Appendix A on page 43 before continuing.

Topics

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Running the AMP1-16-M Manager

The AMP1-16-M Manager allows you to customize the monitor's configuration to perfectly suit your needs.

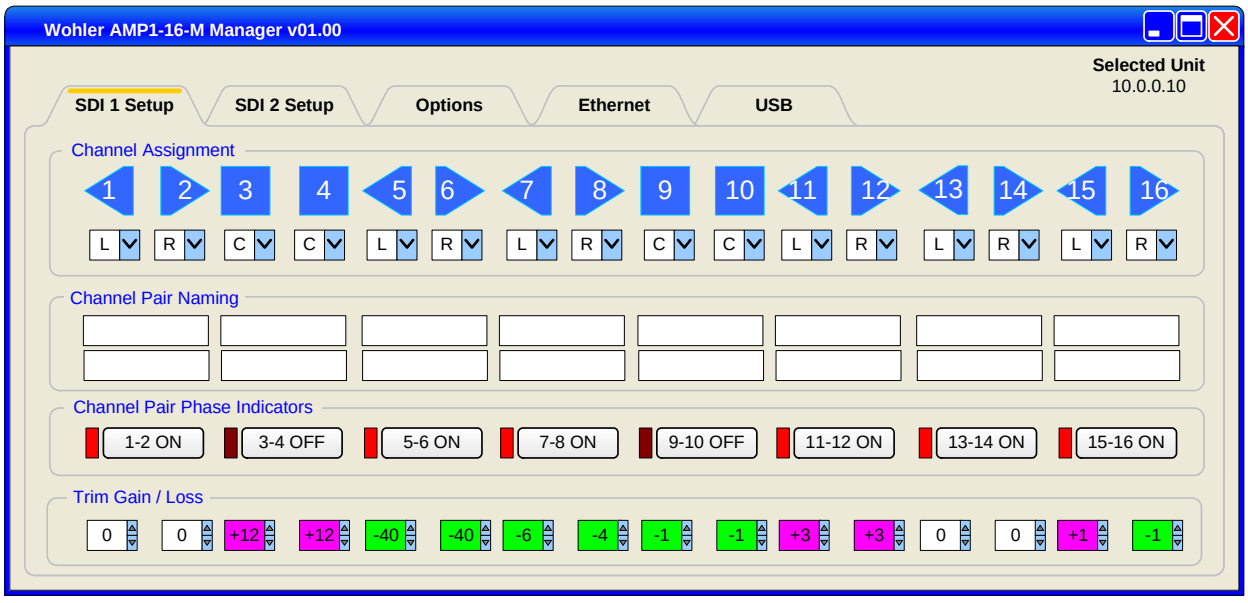
Note: When running, the Manager will lock out the menu system (depending on your settings in the **Options** tab) and flash drive connectivity screens in the event someone attaches a working flash drive to the USB port of the AMP-16-M.

The SDI Setup Tabs

Since the **SDI 1 Setup** and **SDI 2 Setup** screens are identical, we are only showing and describing the **SDI 1 Setup** screen for our example.

1. Launch the **AMP1-16-M Manager**.

Figure 3–1 AMP1-16-M Manager SDI Setup Screen


Wohler AMP1-16-M Manager v01.00
Selected Unit
10.0.0.10
SDI 1 Setup
SDI 2 Setup
Options
Ethernet
USB
Channel Assignment
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
L R C C L R L R C C L R L R L R
Channel Pair Naming
Channel Pair Phase Indicators
1-2 ON
3-4 OFF
5-6 ON
7-8 ON
9-10 OFF
11-12 ON
13-14 ON
15-16 ON
Trim Gain / Loss
0 0 +12 +12 -40 -40 -6 -4 -1 -1 +3 +3 0 0 +1 -1

2. **Channel Assignment**: Click the drop downs to select whether each channel should be directed to the right, left, or both speakers.

3. **Channel Pair Naming**: In the blank fields at the middle of the screen, you can add names for any channel pair. Each name is

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comprised of the top and bottom field, and each field allows up to seven characters.

4. **Channel Pair Phase Indicators**: For each channel pair, click the button to toggle the phase indication on or off.

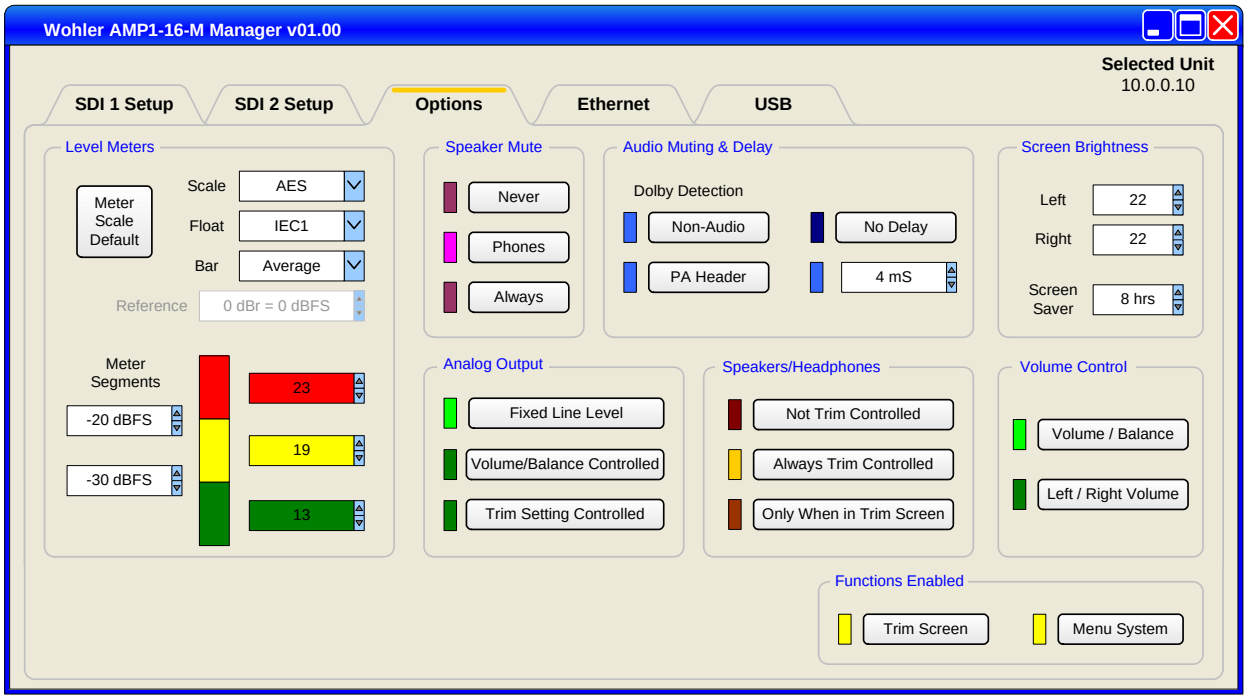
5. **Trim Gain/Loss**: Click the up or down arrows beside each **Trim/Gain Loss** value to either increase or decrease the gain or loss.

6. When you're done with this screen, click the **SDI 2 Setup** screen and repeat Steps 2 through 5 above for the second SDI input.

The Options Tab

1. Click the **Options** tab.

Figure 3–2 AMP1-16-M Manager Options Screen



2. In the **Level Meters** area, click the drop downs to select the **Scale**, **Float**, and **Bar** for your level meter display. Alternatively,

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you can click the **Meter Scale Default** button to return to the default for that scale. The scale itself won't change.

3. Also in the **Level Meters** area, click the up or down arrows to select the levels at which the colors between the top and middle segments and the middle and lower segments.

4. Click the up or down arrows to select the colors for each of the level meter segments.

5. In the **Speaker Mute** area, click to select one of three speaker configurations:

   A. **Never**: Never mute the speakers even when headphones are connected.

   B. **Phones**: Only mute the speakers when the headphones are connected.

   C. **Always**: Always keep the speakers muted. This option may be useful if you only want to monitor audio externally, through the XLR audio outputs on the rear panel.

6. In the **Analog Output** area, click to select one of three output volume options. **Fixed Line Level** is exclusive of the other two:

   Note: Note, if the **Analog Output** is set to controlled and the **Speaker Mute** is set to **Always**, then plugging in the headphones will cause the analog outputs to mute.

   A. **Fixed Line Level**: The volume of the output is fixed to the volume of the corresponding inputs.

   B. **Volume/Balanced Controlled**: The volume of the outputs is controlled by the **Volume** and **Balance** knobs on the front panel.

   C. **Trim Controlled**: The analog outputs are controlled by the **Trim** settings.

7. In the **Audio Muting and Delay** area select any combination of **Non-Audio** or **PA Header**.

   Note: The AMP1-16-M detects PA headers that represent encoded data streams.

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8. For the **Delay**, click either **No Delay**, or click the up or down arrows to either increase or decrease the amount of audio delay time.

9. In the **Speakers/Headphones** area, click either **Not Trim Controlled** to eliminate trim control altogether, **Always Trim Controlled** to enable trim control in both the **Trim Screen** and the **Monitoring Screen**, or **Only When in Trim Screen** to enable trim control only in the **Trim Screen**.

10. In the **Volume Control** area, select the way the **Volume** and **Balance** knobs should operate:

    A. **Volume/Balance**: This setting selects normal **Volume** and **Balance** control operation as labeled on the front panel. This is the default.

    B. **Left/Right Volume**: This setting reconfigures the **Volume** control to work as a left volume control and the **Balance** control to work as a right volume control.

11. In the **Screen Brightness** area, the select the screen brightness for each screen and the duration for the screen saver.

    A. **Left/Right**: Either click the down arrow to increase or decrease the screen brightness value, or click the field and type in a value.

    B. **Screen Saver**: Enter the amount of time you want the monitor to wait until it invokes the screen saver. Allowable values range in 1 minute increments from 5 minutes to 119 minutes, and in 1 hour increments from 2 hours to 24 hours. The default setting is 8 hours.

12. In the **Functions Enabled** area, click **Trim Screen** to enable the **Trim Screen** and/or the **Menu System** to enable the menu system.

If the AMP1-16-M is in operation for the screen saver timeout period and no front panel controls have been turned or pressed, the screens will dim by a certain amount. If double the screen saver timeout period elapses without any front panel control activity, the screens will dim further. Operating any button or control will instantly brighten the screens.

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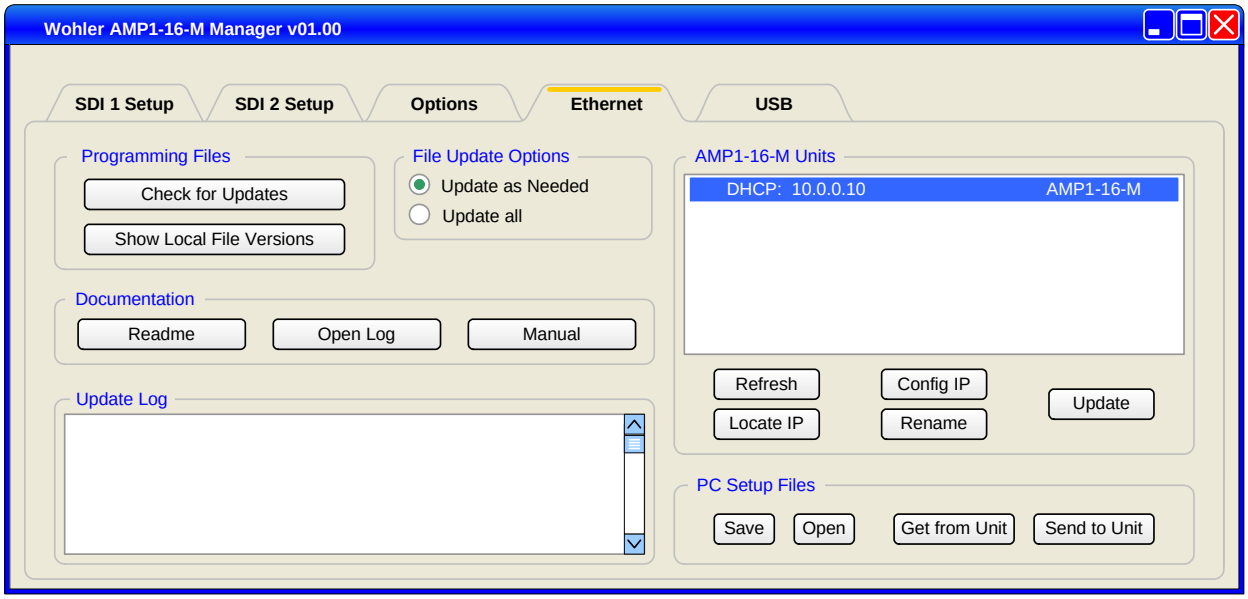
The Ethernet Tab

1. Click the **Ethernet** tab.

Figure 3–3 AMP1-16-M Manager SDI Ethernet Screen



The **Ethernet** tab allows you to transmit configurations and perform a variety of other tasks over a network.

Note: For a complete description of the functions in the **AMP1-16-M Units** area (used for software upgrades) refer to Appendix A on page 43.

For a complete description of the functions in the **Programming Files** area (used to attach AMP1-16-Ms to a network) refer to Appendix B on page 51.

- **Programming Files—Check for Updates**: Clicking this button checks the network for updated software.
- **Programming Files—Show Local File Versions**: Clicking this button displays the current versions of all the software components of the AMP1-16-M.
- **File Update Options**: Before beginning any update procedure, click either **Update as Needed** or **Update All**. **Update as**

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Needed should be used for most updates. **Update All** should only be used at the direction of a tech support representative.

Note: To continue with a software upgrade, refer to Appendix A on page 43.

- **Documentation—Readme**: Clicking this button displays the **readme.txt** file for the downloaded software updates.
- **Documentation—Open Log**: Clicking this button allows you to save the **Update Log** file contained in the **Update Log** window.
- **Documentation—Manual**: Clicking this button allows you to read this document in .pdf format.
- **Update Log**: The **Update Log** area displays system response data to the various functions on this menu.

To perform any of the following functions, you must have an AMP1-16-M selected in the **AMP1-16-M Units** box.

Note: The button descriptions below are *not* listed in the order that they appear on the **Ethernet** tab. Instead, they are listed in the most likely order that you would use them.

- **Get from Unit**: Clicking the **Get from Unit** button transmits the configuration file from the AMP1-16-M that you selected on the **AMP1-16-M Units** box to the PC.
- **Save**: Clicking the **Save** button allows you save an AMP1-16-M configuration file to the PC.
- **Open**: Clicking the **Open** button allows you to select an AMP1-16-M configuration from those saved on your PC.
- **Send to Unit**: Clicking the **Send to Unit** button allows you to transfer an AMP1-16-M configuration file from your PC to the AMP1-16-M that is selected in the **AMP1-16-M Units** box.

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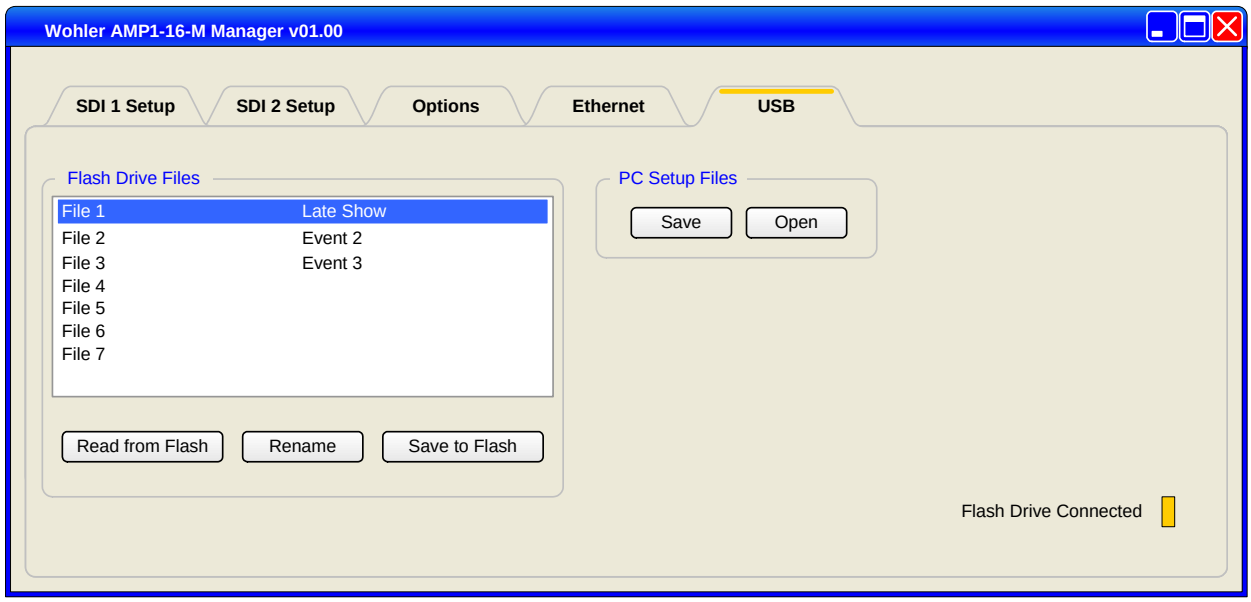
The USB Tab

You can remotely copy up to seven configuration files to or from the AMP1-16-M using a flash drive connected to the USB port on the front of the monitor.

Note: To use the USB port from the AMP1-16-M menu system, refer to USB Port Functionality on page 13.

The **Flash Drive Connected** indicator (bottom of the screen) shows when a flash drive is connected to the USB port to the USB port of the host computer (as opposed to the port in the unit itself) by lighting a bright gold color (on). Otherwise, it is dark brown (off).

Figure 3–4 AMP1-16-M Manager USB Screen



- **Flash Drive Files:** This pane displays a list that shows the seven possible files in the **\Wohler** folder of the flash drive. If no **\Wohler** folder exists, the system will immediately create it when the flash drive is first connected. Clicking on any one of the files (or the empty file positions) selects it for other operations.

- **Flash Drive Files—Read from File**: Clicking on the **Read from File** button loads the selected file into the program. This button is disabled if a valid flash drive file is not selected. The system will only read the files from the **\Wohler** folder on the flash drive.

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- **Flash Drive Files—Rename**: To rename a configuration file, click on the filename you want to rename and then click **Rename**. When the dialog displays, rename the file and click **Save**.

- **Flash Drive Files—Save to File**: Clicking the Save to File button saves the program setup configuration to either the selected empty file, or to the selected existing file on the connected flash drive. If you want to save to an existing file, a dialog box opens to confirm that you really want to overwrite the file. If you want to save to an empty file, a dialog box opens so you can name the file. No matter what you type, the saved file will start with the same number (1 through 7) as the selected file. Files can only be saved to the **\Wohler** folder on the flash drive.

- **PC Setup Files—Save**: In the **Flash Drive Files** area, click to select one file, or [Ctrl]+[click] to select multiple files to save to the PC's hard drive. Then click **Save**. When the **Save As** dialog appears, browse to the location in which you want to save the configuration files and then click **Save**.

  Note: This button has the exact same functionality as the **Save** button on the **Ethernet** tab. It is repeated here for your convenience.

- **PC Setup Files—Open**: In the **Flash Drive Files** area, click to select a file to load in the AMP1-16-M, then click **Open**.

  Note: This button has the exact same functionality as the **Save** button on the **Ethernet** tab. It is repeated here for your convenience.

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CHAPTER 4
Internal Menu System

Introduction

Overview

This chapter provides an in-depth description of all the features, specifications, and menus and all their respective options and functions. Note that the menus are listed alphabetically for easy reference.

Important: The AMP1-16-M local menus cannot be used at the same time that the PC setup software is connected. If this happens, the PC Setup Software will take precedence and display a yellow diamond notifying you about the PC connection. When the PC access is finished, the yellow diamond will disappear, once again enabling local menu access.

Topics

Topics	Page
Menu Navigation Overview	26
Audio Menu	27
Trim Menu	28
Channel Assignment Menu	29
Options Menu	30
Meter Type and Reference Menu	32
Meter Segment Menu	34
Versions and Ethernet Menu	35

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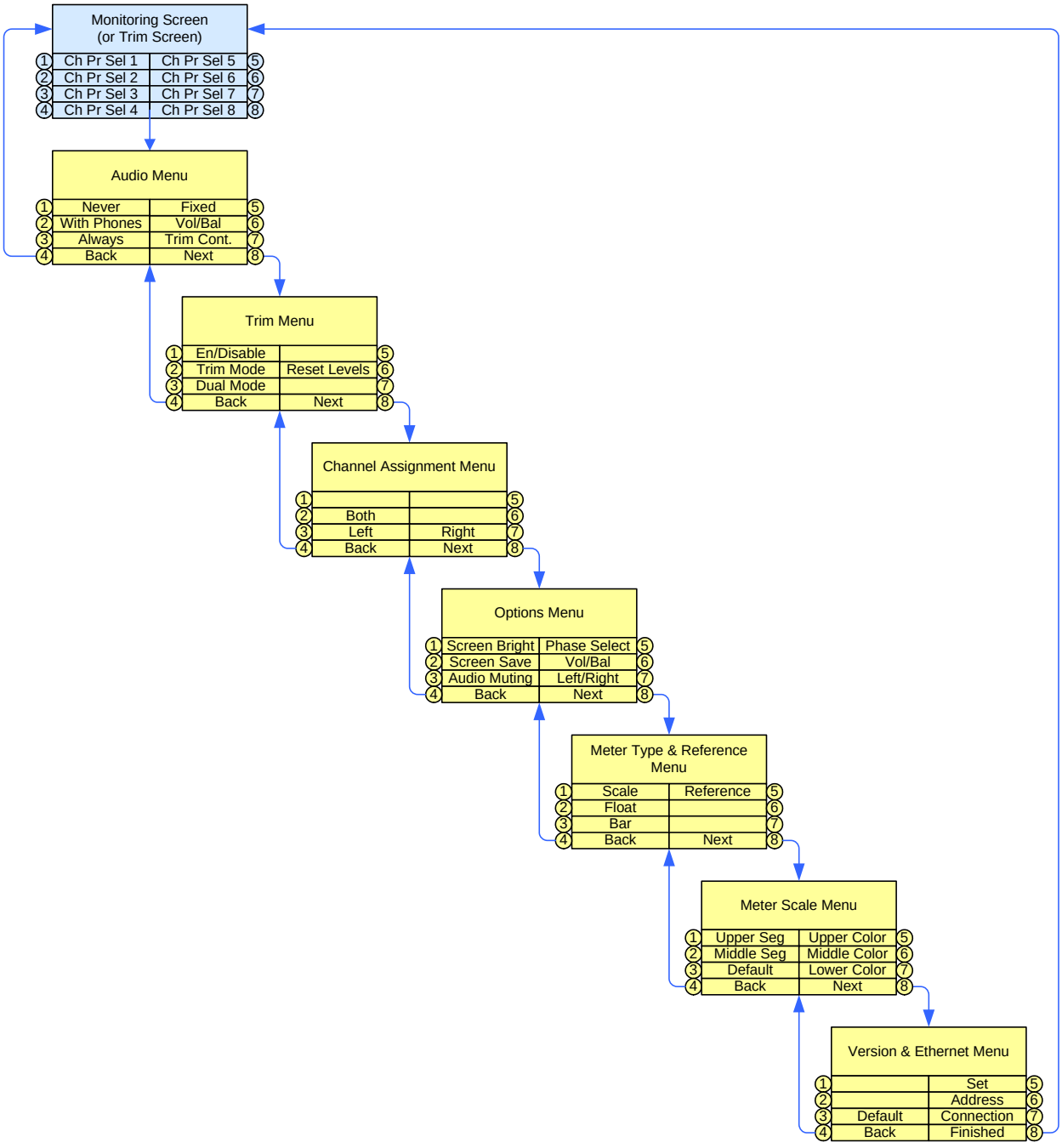
Menu Navigation Overview

You can launch the menu system by pressing and holding the **Trim** button for three seconds. Within any menu, holding the **Trim** button for three seconds exits the menu system. Navigate the menu tree with the **Back** and **Next** button at the bottom of each screen.

Figure 4–1 Menu Tree



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- **Back**: Pressing this button closes this menu and opens the previous menu, one step up the menu tree.
- **Next**: Pressing this button closes this menu and opens the next menu, one step down the menu tree.

Audio Menu

This menu allows adjustment of various audio related settings. Buttons 1, 2, and 3 together form a **Speaker Mute** selector. The default **Speaker Mute** is **Mute with Headphone**. Buttons 5 and 6 together form an **Analog Output** selector. The standard **Analog Output** is **Fixed Line Level**.

Figure 4–2 Audio Menu

- **Never Mute**: Pressing this button selects the option that the internal speakers will not mute when headphones are plugged into the headphone jack.
- **Mute with Headphone**: Pressing this button selects the option that the internal speakers will mute when headphones are plugged into the headphone jack. This is the default setting.
- **Always Mute:** Pressing this button selects the option that the internal speakers will always be muted. This setting can be convenient to use when monitoring is always done through the analog outputs with external amplifiers and speakers.

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- **Fixed**: Pressing this button fixes the line level of the analog outputs as they are in the SDI signal, where -20 dBFS = +4 dBu (± 1 dB). This is the default setting.

- **Volume / Balance**: Pressing this button enables the **Volume** and **Balance** controls to affect the analog outputs. This setting can be convenient to use when monitoring is always done through the analog outputs with external amplifiers and speakers.

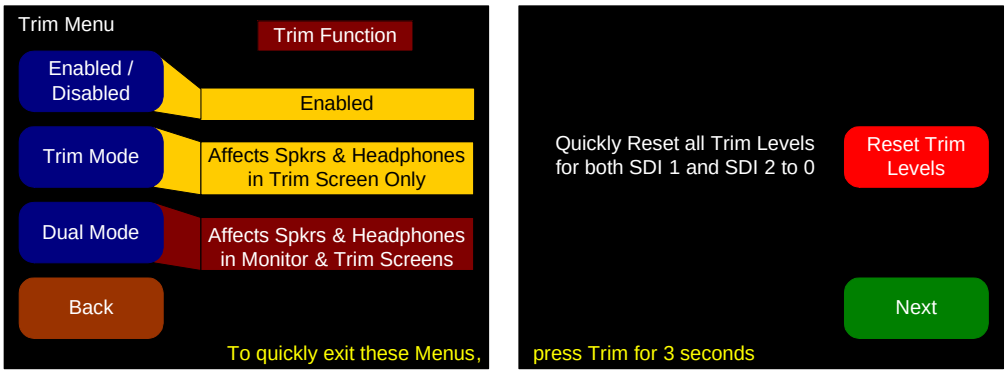
  Note: Note, if the **Analog Output** is set to controlled and the **Speaker Mute** is set to **Always**, then plugging in the headphones will cause the analog outputs to mute.

- **Trim**: Pressing this button enables the **Trim** controls to affect the analog outputs.

Trim Menu

The **Trim Menu** allows you to select customized settings for the levels of each channel or input pair.

Figure 4–3 Trim Menu


Trim Menu
Trim Function
Enabled / Disabled
Enabled
Trim Mode
Affects Spkrs & Headphones in Trim Screen Only
Dual Mode
Affects Spkrs & Headphones in Monitor & Trim Screens
Back
To quickly exit these Menus, press Trim for 3 seconds
Quickly Reset all Trim Levels for both SDI 1 and SDI 2 to 0
Reset Trim Levels
Next

1. **Enabled / Disabled**: Pressing this button toggles the Trim feature on (enabled) and off (disabled). When disabled, pressing the **Trim** control will not enter the **Trim Screen**. Also, the **Trim** mode and **Dual** mode buttons are dark, but not disabled.

   Note: When disabled, the **Trim Controlled** option on the **Audio Menu** is disabled.

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2. **Trim Mode:** Pressing this button puts the product in **Trim** mode and automatically selects **Enabled** for the **Enabled / Disabled** button. The **Trim Screen** can be accessed when the **Trim** control is pressed but any **Trim** adjustments only affect the speaker and headphone volume when the **Trim Screen** is showing.

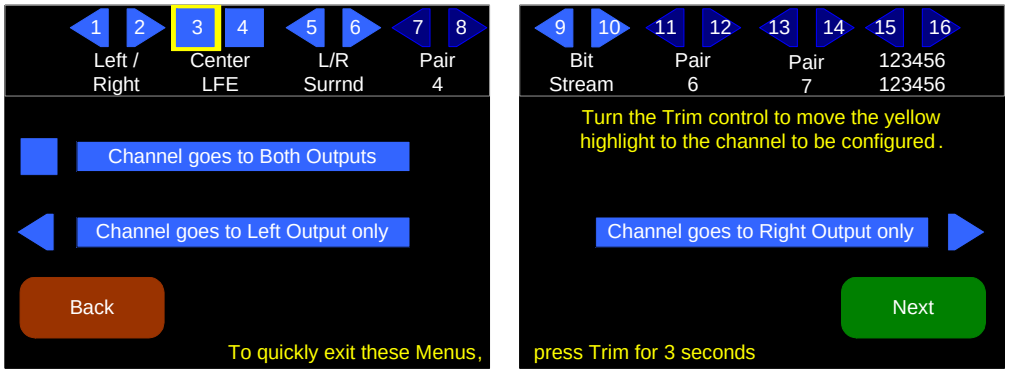
3. **Dual Mode:** Pressing this button puts the product in **Dual** mode and automatically selects **Enabled** for the **Enabled / Disabled** button. The **Trim Screen** can be accessed when the **Trim** control is pressed and any **Trim** adjustments always affect the speaker and headphone volume, whether the **Trim Screen** or the **Main Screen** are showing.

4. **Reset Trim Levels**: Pressing this button opens the following warning screen in place of the right-hand display: "Reset all trim gains or losses for both SDI inputs to zero. Press again to confirm." Pressing this button again resets all of the **Trim** gains to zero for both SDI inputs.

Channel Assignment Menu

This menu allows setup of channel-to-speaker assignments.

Figure 4–4 Channel Assignment Menu


1 2 3 4 5 6 7 8
Left / Right
Center LFE
L/R Surrnd
Pair 4
Channel goes to Both Outputs
Channel goes to Left Output only
Back
To quickly exit these Menus,
9 10 11 12 13 14 15 16
Bit Stream
Pair 6
Pair 7
123456 123456
Turn the Trim control to move the yellow highlight to the channel to be configured.
Channel goes to Right Output only
Next
press Trim for 3 seconds

Turning the **Trim** knob left or right highlights each of the 16 channels. Rotate to select a channel, then press **Both**, **Left**, or **Right**.

- **Channel goes to Both Outputs**: Pressing this button sets the selected channel to go to both speakers and both analog outputs.

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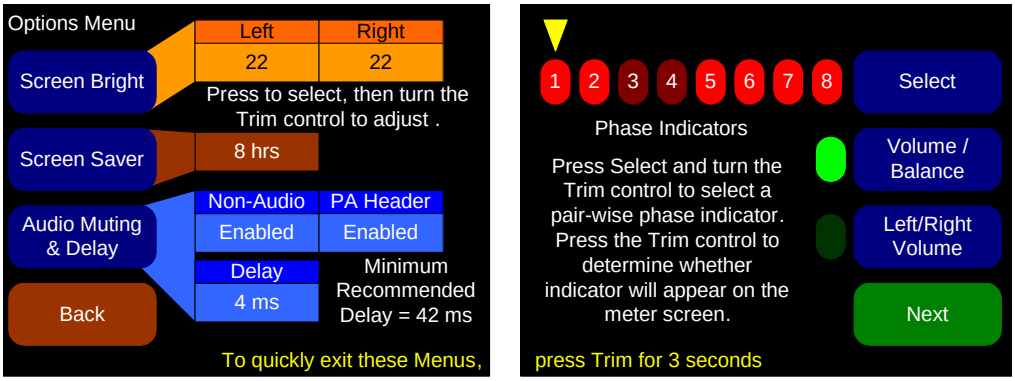
- **Channel goes to Left Output only**: Pressing this button sets the selected channel to go to the left speaker and to the left analog output.

- **Channel goes to Right Output only**: Pressing this button sets the selected channel to go to the right speaker and to the right analog output.

Options Menu

The **Options Menu** allows you to adjust the brightness of each screen independently, and to set the duration of inactivity before the screen saver activates.

Figure 4–5 Options Menu



- **Screen Bright**: Press this control to toggle between the adjustment for the left screen and the right screen. When a screen is selected, rotate the **Menu** knob to adjust the screen brightness. Thirty-two adjustment steps are provided for each screen from very dim to bright. The actual brightness of each screen will change as the control is turned. The default brightness for both screens is 22.

- **Screen Saver**: Pressing this button and then rotating the **Menu** knob selects the screen saver timeout. Select values from 5 minutes to 119 minutes (in 1-minute increments) and from 2 hours to 24 hours (in 1-hour increments). The default setting is 8 hours.

  If the AMP1-16-M is in operation for the screen saver timeout period and no front panel controls have been turned or pressed, the screens will dim by a certain amount. If double the screen saver

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timeout period elapses without any front panel control activity, the screens will dim further. Operating any button or control will instantly brighten the screens.

- **Audio Muting & Delay**: Pressing this button selects the **Non-Audio**, **PA Header**, and **Delay** adjustment. Rotating the **Trim** knob changes the selected adjustment within its range. The **Non-Audio** and **PA Header** detection can be either enabled or disabled. These controls determine if and how much to mute non-audio signals, such as Dolby bitstreams. The **Delay** can be either **Off** or 4 to 160 ms. The default settings are:
  - **Non-Audio**: Enabled
  - **PA Header**: Disabled
  - **Delay**: 4 ms

  The AMP1-16-M can detect whether a digital audio stream contains PCM encoding, or some other compressed data format such as Dolby Digital™ , in two different ways.

  The bitstream contains a non-audio bit. When set, this indicates that the bitstream is not PCM encoded, and therefore, should be muted. This bit occurs once every 4 ms in a 48 kHz audio stream. Unfortunately, some equipment does not set this bit even when a bitstream is not PCM encoded, or will erroneously set this bit when a bitstream is PCM encoded. Thus, there is also a second method of detection.

  This unit can look for special words within the data stream known as *PA Headers*. These headers occur once every video frame. Assuming the slowest frame rate of 24 FPS, these occur every 42 ms. Thus, the delay should be set to a minimum of 42 ms for this detection method alone. The inherent problem with this detection method is that if the bitstream is altered in any way (gain change, equalization, or other forms of processing) these words will also be scrambled and not detected. However, if the non-audio bit is set correctly, it will survive these processes.

  You may choose to employ neither, either, or both detection methods. If the amount of delay entered is too short, there may be a small burst of noise when an incoming audio stream switches from PCM encoding to a compressed format.

- **Select**: Pressing this button and then rotating the **Trim** knob selects the phase indicator to be adjusted. Press the **Select** button to

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turn the selected phase indicator **On** or **Off**. When set to **On**, an out of phase condition for the associated pair will be displayed on the **Main Screen** and when set to **Off**, out of phase conditions for the associated pair will not be displayed on the **Main Screen**. By default all phase indicators are enabled.

- **Volume / Balance**: Pressing this button causes the front panel knobs to function as **Volume** and **Balance** controls. This is the default setting.

- **Left / Right Volume**: Pressing this button causes the front panel knobs to function as **Left Volume** and **Right Volume** controls.

Meter Type and Reference Menu

The **Meter Type and Reference Menu** allow you to define the level meter scale, float, bar and reference.

Figure 4–6 Meter Type and Reference Menu

- **Scale**: Pressing this button and then rotating the **Trim** knob steps through the scales for the level meters. Six selections are available as shown in Table 4–1 below.

Table 4–1 Meter Limits and References

Scale	Bottom Limit	Top Limit	Default Reference	Default Color Bounds		Default Ballistics	
				Lower	Upper	Float	Bar
AES	-72 dBFS	0.0 dBFS	0 dBFS = 0 dBFS	-30 dBFS	-20 dBFS	IEC Type I	VU
VU	-45 dBr	+3.5 dBr	-20 dBFS = 0 dBr	-3 dBr	0 dBr	—	VU

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Table 4–1 Meter Limits and References (Continued)

Scale	Bottom Limit	Top Limit	Default Reference	Default Color Bounds		Default Ballistics	
				Lower	Upper	Float	Bar
Extd VU	-56 dBr	+16.0 dBr	-20 dBFS = 0 dBr	-10 dBr	0 dBr	–	VU
BBC (EBU)	-13.25 dBr	+13.0 dBr	-18 dBFS = 0 dBr	0 dBr	8 dBr	–	IEC Type II
Nordic	-44 dBr	+12.5 dBr	-18 dBFS = 0 dBr	-10 dBr	0 dBr	–	IEC Type I
DIN	-53 dBr	+5.5 dBr	-15 dBFS = 0 dBr	-5 dBr	0 dBr	–	IEC Type I

- **Float**: Pressing this button and then rotating the **Trim** knob adjusts the ballistics of the floating segment.

Table 4–2 Meter Timings

Ballistics	Rise	Fall	
		Level Change	Time
VU	Not Specified		
IEC Type I	5 ms to reach -2 dB of settled reading	-20 dB	1.7 sec.
IEC Type II	10 ms to reach -2 dB of settled reading	-24 dB	2.8 sec.
None	Bar or Floating Segment Not Displayed		

- **Bar**: Pressing this button and then rotating the **Trim** knob steps through the available settings for the bar ballistics. Refer to Table 4–1 on page 32.

- **Reference**: Pressing this button and then rotating the **Trim** knob adjusts the reference. Refer to Table 4–1 on page 32 for the reference standards for each scale.

  Note: The AES scale does not allow you to set a reference.

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Meter Segment Menu

On the **Meter Segment Menu**, you can customize your level meter segments thresholds and colors.

Figure 4–7 Meter Segment Menu

- **Upper Segment**: Pressing this button and than rotating the **Trim** knob adjusts the division between the upper and middle segments. You can adjust the color boundary in 1 dBr increments, and it has the same range as the bottom and top limits of the meter.

- **Middle Segment**: Pressing this button and than rotating the **Trim** knob adjusts the division between the middle and lower segments. You can adjust the color boundary in 1 dBr increments, and it has the same range as the bottom and top limits of the meter.

- **Default**: Pressing this button changes the settings on this menu and on the **Meter Type and Reference Menu** back to the factory settings for the chosen scale type.

- **Upper, Middle, and Lower Color**: Pressing this button and then rotating the **Trim** knob cycles the upper, middle, or lower color of the displayed sample level meter color through a wide variety of colors.

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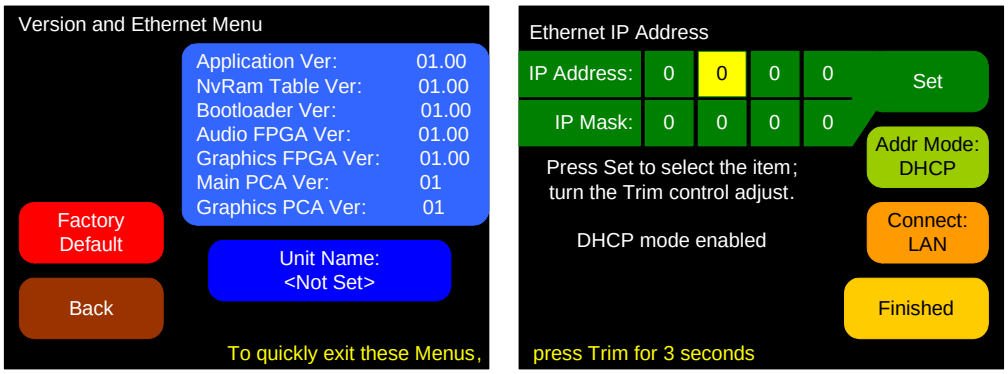
Versions and Ethernet Menu

This menu displays software and hardware versions, as well as Ethernet settings. By default, the DHCP setting is enabled and the IP Address and IP Mask settings are shown as 0.0.0.0. This means it will automatically attempt to get the needed IP Address and IP Mask settings from the network.

Figure 4–8 Versions and Ethernet Menu



- **Factory Default**: Pressing this button opens a cautionary window to verify that you really want to restore the AMP1-16-M setup to the factory default. If you press the **Factory Default** button again, the action proceeds and the unit will restart. Otherwise, after five seconds, the factory default request is cancelled. You can also cancel the factory default request by pressing any other button.

  Note: The **Factory Default** action restores the entire unit to its factory condition. The unit name is deleted, the **IP Address** is set to DHCP, and the **Connect:** setting is reset to LAN.

- **Set (IP Address** or **IP Mask)**: Pressing this button highlights the first of the four octets, turning the **Menu/Trim** encoder clockwise increases the octet; turning it counterclockwise reduces the octet. Pressing either the **Set IP Address** or the **Menu/Trim** encoder advances the highlight to the next octet. Advancing beyond the last octet returns the highlight to the first octet.

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Important: If the IP information has been changed, the unit will have to restart. A warning diamond will display, and you will need to confirm or cancel before proceeding.

If the information in the IP fields is not correct, the changes made in the IP fields will be ignored. The IP address is valid if the screen reads "DHCP Mode Enabled" or "Static IP Mode Enabled."

- **Addr Mode**: Pressing this button selects between **DHCP** and **Static** address modes.

- **Connect**: Pressing this button selects between a **LAN** connection and a **Direct** connection.

Important: This enables a single-address DHCP server. Thus, when a computer is connected directly, both the unit and the host computer will be assigned a DHCP address, and they will be able to communicate. However, this setting will cause problems with some LANs. If this unit will be connected to a LAN, leave this setting in the **Connect: LAN** setting which disables the internal DHCP server.

- **Finished**: Pressing this button closes this menu and returns to the **Monitoring Screen**.

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CHAPTER 5
Features and Specifications

Introduction

Overview

This chapter lists the features and specifications of the features and options of each local, internal menu.

Topics

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Specifications	39
Technical Functional Overview	41

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Features

- Totally digital system architecture with high fidelity Class D amp
- Stereo or mono monitoring
- **Volume** and **Balance** controls can optionally become **Left Volume** and **Right Volume** controls.
- Quick push-button selection of any pairs to sum to monitor
- Dual 3G/HD/SD-SDI inputs for audio monitoring
- Regenerated loop outputs of each SDI input
- Re-clocked output of the selected SDI input
- Balanced stereo analog outputs on XLR-M: optionally **Volume/ Balance** controlled or fixed line output
- Front panel ¼" headphone jack
- Automatic frame rate detection and selection
- Level metering of all 16 de-embedded SDI channels
- High resolution metering with 166 segments displayed
- Level Meter Representation: Simultaneous average and PPM
- Brightness control for each screen, 32 levels
- Permanent internal storage for all options and settings
- Easy update management software
- Shallow chassis depth
- IEC power input, 100 – 240 VAC +/- 10%, 50/60 Hz
- Each stereo input source has its own stereo phase indicator displayed on the **Main Screen**.
- User selectable meter scale, color thresholds, and ballistics

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Compliance

All components comply with UL, CE, and RoHs specifications.

The AMP1-16-M also meets FCC Part 15 compliance.

Specifications

Table 5–1 Specifications

Specification	Values / Domains
Power requirements	100 V to 240 V AC ± 10%, 50/60Hz
Power consumption	60 Watts
Dimensions (H x W x D)	1.75" x 19" x 4.25" (44mm x 483mm x 107mm)
Weight	5 lbs. (2.3 kg)
Space Required	1 RU (rack unit)
Supplied Accessories	AC Power Cord (North America)
Display Type	TFT LCD
Number of Displays	2
Screen Size	2.4" diagonal per screen
Screen Resolution	320 x 240
Inputs	SDI: 2 3G/HD/SD-SDI on BNC
Outputs	• SDI: 2 regenerated on BNC • SDI: 1 selected reclocked on BNC • Analog: 2 balanced channels on XLR-M
Level Meters	166 segments
Level Meter Scales	Selectable: • AES, • VU, • Ext. VU, • BBC, • EBU, • Nordic, and • DIN

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Table 5–1 Specifications (Continued)

Specification	Values / Domains
Level Meter Characteristics	Selectable: • Meter thresholds, • Reference, • Segment Colors, and • Ballistics
Peak Acoustic Output	90dB SPL (@ 2 feet)
Power Output RMS	6 W RMS, 12 W peak (each side)
Frequency Response	150 Hz to 16 kHz (± 5 dB)
Analog Output Reference Level	-20 dBFS = +4 ± 1.0 dBu
Analog Output Frequency Response	40 Hz to 20 kHz (± 1dB)
Analog Output Distortion	<0.01% THD+N
Analog Output Dynamic Range	> 100 dB
SDI Input Termination	75 Ω unbalanced
Hum and Noise	Better than -68dB below full output
Electrical Distortion	<0.05% at any level below limit threshold

Audio Formats

All of the audio formats listed in Table 5–2 below are available for monitoring in the AMP1-16-M.

Table 5–2 Audio Formats

Standard	Format	Rate
SD		29.97
		25

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Table 5–2 Audio Formats

Standard	Format	Rate
HD	720p	23.98
		24
		25
		29.97
		30
		50
		59.94
		60
	1035i	29.97
		30
	1080i	25
		29.97
		30
	1080sf	23.98
		24
		25
		29.97
		30
	1080p	23.98
		24
		25
		29.97
		30
3G	1080p	50
		59.94
		60

Technical Functional Overview

Figure 5–1 on page 42 illustrates the overall functionality of the AMP1-16-M monitor.

Note: Stereo phase indication measurement occurs in the signal chain before it is routed to the speakers.

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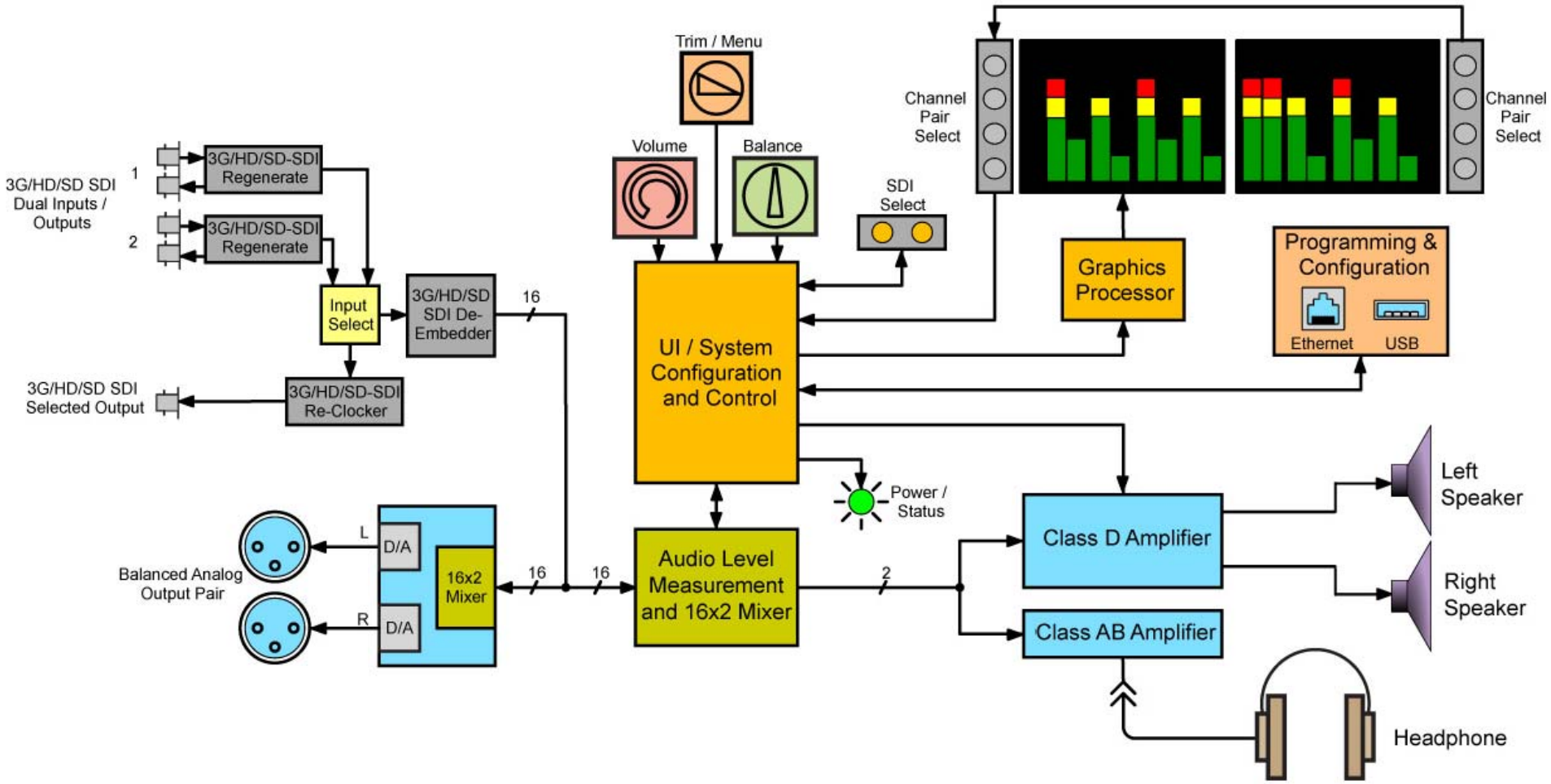
Figure 5–1 AMP1-16-M Block Diagram



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APPENDIX A
Connecting the AMP1-16-M to a LAN

Introduction

Overview

This chapter describes how to connect your PC to your AMP1-16-M through a local area network (LAN) and to configure the monitor using the graphical user interface (GUI) on a PC.

Topics

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Launching the AMP1-16-M Manager	46
Adding Your AMP1-16-M to Your Network	47

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Requirements

- You must have a PC or laptop that:
  - Is running Windows XP, Vista, or Windows 7,
  - Is connected to a LAN, and
  - Has access to the Internet.
- An IP address from your network administrator (not required if your network uses DHCP)
- An IP mask from your network administrator (not required if your network uses DHCP)
- A standard Ethernet cable to connect the AMP1-16-M to your LAN
- Your product's serial number (if you have not already created a user ID and password for the Wohler web site)

Downloading the File

You will need to download the AMP1-16-M Manager from the Wohler web site.

1. Power up your PC and create a folder on your desktop called **AMP1-16-M**.
2. Launch the web browser and navigate to the wohler web site: www.wohler.com.

Decision Point:

If you already have a member user ID and password for the Wohler web site, then log in by clicking on the Member Sign In link at the top right hand corner of the home page and sign in.

Otherwise, if you do *not* already have a member user ID and password then you must click Register as New User at the top right hand corner of the home page, and enter the requested data. Remember to log in after you have created your account.

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3. Once you have successfully logged into the Wohler web site, click **Products** from the home page menu bar.

   A. Move the cursor down the menu to highlight **Audio.**

   B. Then move the cursor to the sub-menu to highlight **SDI**.

   C. Finally, move the cursor to the third menu to click on **AMP1-16-M**. When the monitor's web page displays, click on the **Downloads** tab in the middle of the page.

4. Down load the AMP1-16-M configuration Manager.

   A. Double-click **AMP1-16-M Manager (MSI)** to begin the download.

   B. When the **File Download** dialog appears, click **Save**.

   C. When the **Save As** dialog appears, navigate to the folder you created in Step 2 on page 44 and click **Save**.

5. Double-click the **AMP1-16-M Manager (MSI)** on the desktop to display the contents.

6. Extract the file(s) to your desktop.

Installing the AMP1-16-M Manager

Important: You must use an extracted setup file. Running the installer from within the .zip file does not work.

Double-click the **AMP1-16-M Manager.exe** application and follow the steps through the installation.

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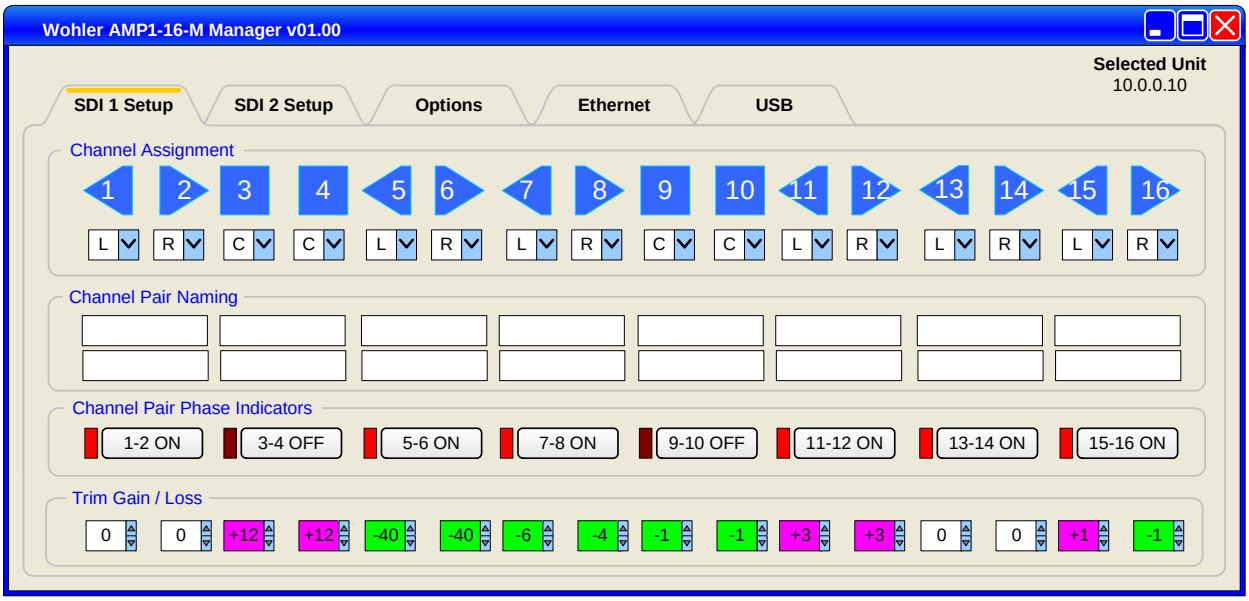
Launching the AMP1-16-M Manager

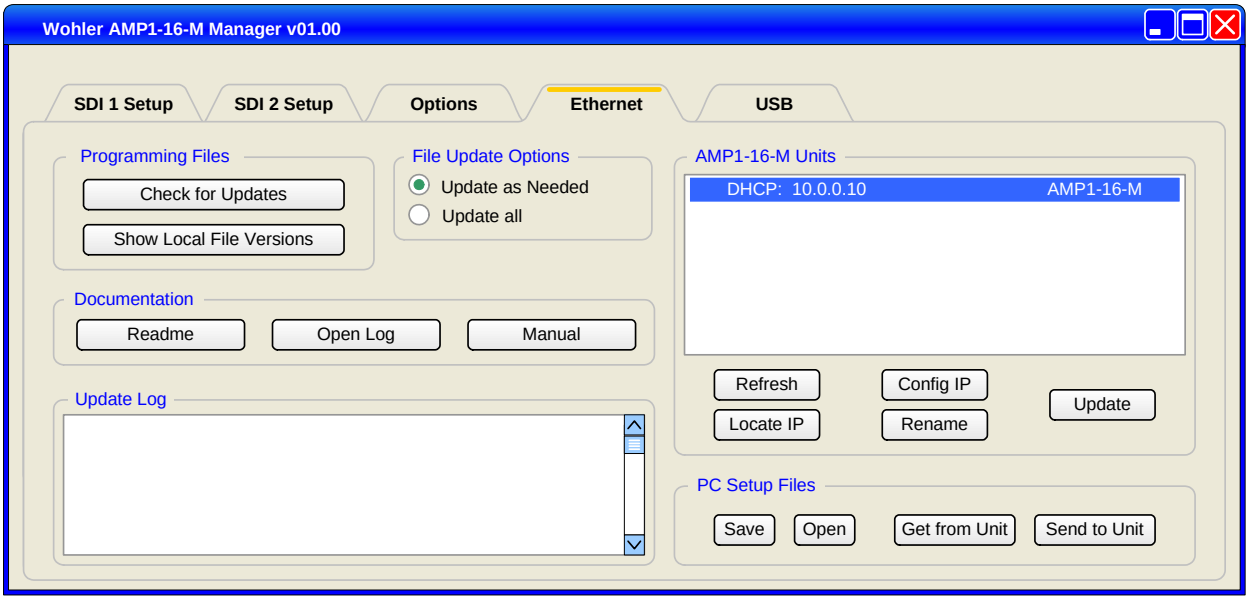
1. Launch the **AMP1-16-M Manager** from the Desktop. When the **AMP1-16-M Manager** appears, it will display the **SDI 1 Setup** tab by default.

Figure A–1 AMP1-16-M Manager SDI 1 Setup Tab


Wohler AMP1-16-M Manager v01.00
Selected Unit
10.0.0.10
SDI 1 Setup
SDI 2 Setup
Options
Ethernet
USB
Channel Assignment
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
L R C C L R L R C C L R L R L R
Channel Pair Naming
Channel Pair Phase Indicators
1-2 ON
3-4 OFF
5-6 ON
7-8 ON
9-10 OFF
11-12 ON
13-14 ON
15-16 ON
Trim Gain / Loss
0 0 +12 +12 -40 -40 -6 -4 -1 -1 +3 +3 0 0 +1 -1

2. Click the **Ethernet** tab.

Figure A–2 AMP1-16-M Manager Ethernet Tab



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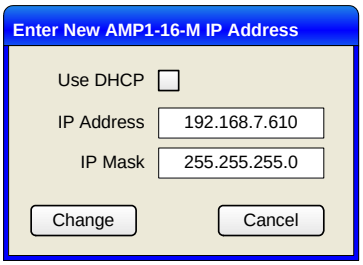
Adding Your AMP1-16-M to Your Network

Note: Usually, you will set up the IP address of your AMP1-16-M using the **Versions and Ethernet** menu on the unit. This section is provided when only remote access is available.

1. If you have not already done so, connect an Ethernet cable from the Ethernet port of the AMP1-16-M (labeled **Ethernet**) to the network.
2. Click **Refresh**.
3. Click on the unit you wish to configure in the **AMP1-16-M Units** list.
4. Click **Config IP**.

Figure A–3 Enter AMP1-16-M Address Dialog



5. When the **Enter AMP1-16-M IP Address** dialog displays, do the following:
   A. Click the **Use DHCP** check box (if needed) to select DHCP.

Important: If your network uses DHCP, then skip Steps B and C and continue on to Step D below.

   B. Enter the **Unit IP Address**.
   C. Enter the **Unit IP Mask**.
   D. Click **OK** to close the dialog.

To change the IP settings, the unit must restart. The Windows application will automatically restart the unit, and display the unit with its new address after it has rebooted. This takes approximately 10 seconds.

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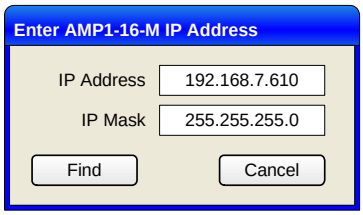
6. Click **Refresh**. After the system polls the network, all the AMP1-16-Ms on the network will display in the **AMP1-16-M Units** box.

7. In the event that the AMP1-16-M you're looking for does not appear in the **AMP1-16-M Units** box, click **Locate IP** to display the following dialog so you can enter the IP address of the AMP1-16-M unit you're looking for.

Figure A–4 Locate IP Address Dialog



A. Enter the **IP Address** of the AMP1-16-M that you're trying to locate on the network.

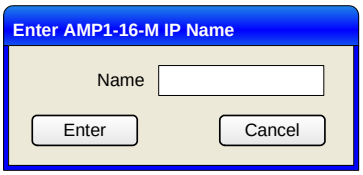
B. Enter the **IP Mask**.

C. Click **Find**.

Important: You must see your AMP1-16-M listed in the **AMP1-16-M Units** area. If not, double-check your connections. If the monitor still does not display, call Wohler's technical assistance. (See Wohler's contact into on page ii.)

8. Once your AMP1-16-M displays in the **AMP1-16-M Units** box, click **Rename** button.

Figure A–5 Enter AMP1-16-M Address Dialog



9. Give this AMP1-16-M a unique (human-readable) **Name**. This field will accept up to 16 characters.

Important: The name you select for this AMP1-16-M should denote its position or function within your facility so that it can be easily recognized later.

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10. Either click the **Enter** button, or press the **Enter** key to close the window.

11. On the outside chance, the monitor does not automatically show up in the **AMP1-16-M Units** area, click the **Refresh** button.

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APPENDIX B
Software Upgrades

Introduction

Overview

This chapter describes how to download software upgrades to your PC and then transfer and install them to your AMP1-16-M.

Important: If you have not yet installed the AMP1-16-M Manager setup software into your PC and connected it to the AMP1-16-M, you **must** complete all the steps in Appendix A before continuing.

Topics

Topics	Page
Checking for Updates	52
Upgrading the AMP1-16-M	54

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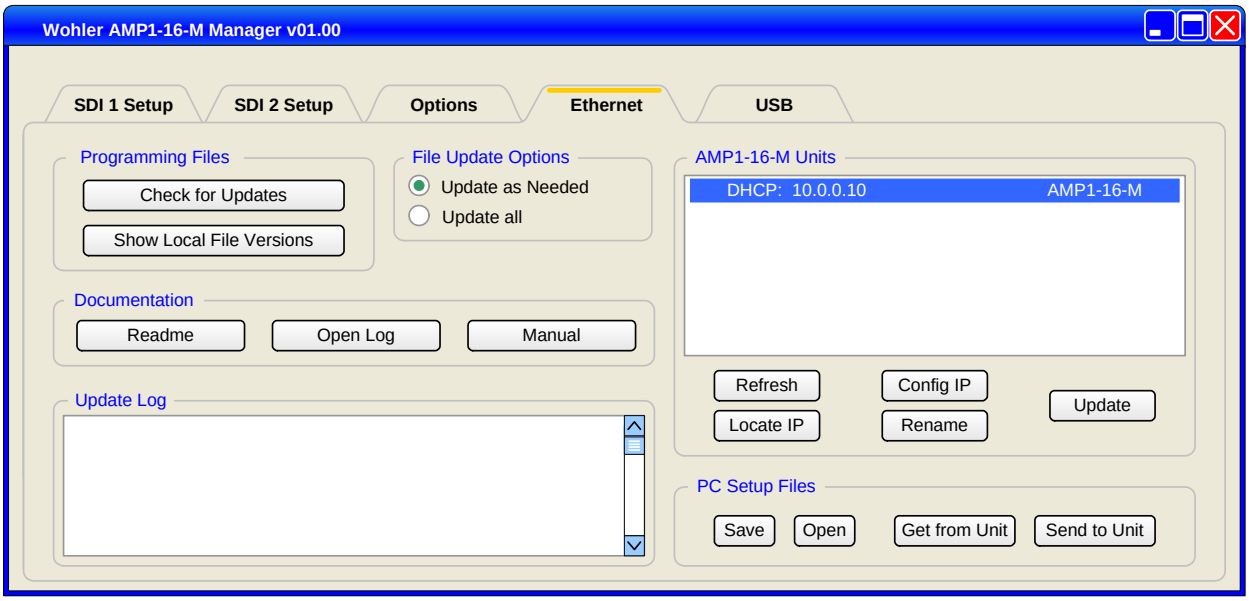
Checking for Updates

Before establishing the connection to the AMP1-16-M, you should check to see if any software updates are currently available.

1. Launch the **AMP1-16-M Manager** from your PC's desktop.

2. Click the **Ethernet** tab.

Figure B–1 AMP1-16-M Manager SDI Ethernet Screen



3. Click **Show Local File Versions** to display the versions of the programming files on your hard drive, if any.

4. Click **Check for Updates**. At this point, the system will respond with one of three dialogs:

   A. **No New Updates**: In the event that no new updates are available, then the system will display the dialog shown in Figure B–2 on page 53.

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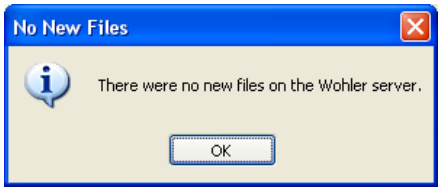
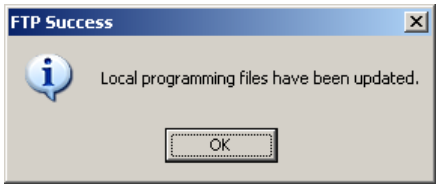
Figure B–2 No New Files Dialog



B. In the event the system discovers updates to the AMP1-16-M firmware stored on your hard drive, the system will display the dialog shown in Figure B–3 below.

Figure B–3 FTP Success Dialog



5. In any case, click **OK**.

Decision Point:

If no new updates are currently available, then this concludes the update procedure.

Otherwise, continue on to Upgrading the AMP1-16-M on page 54.

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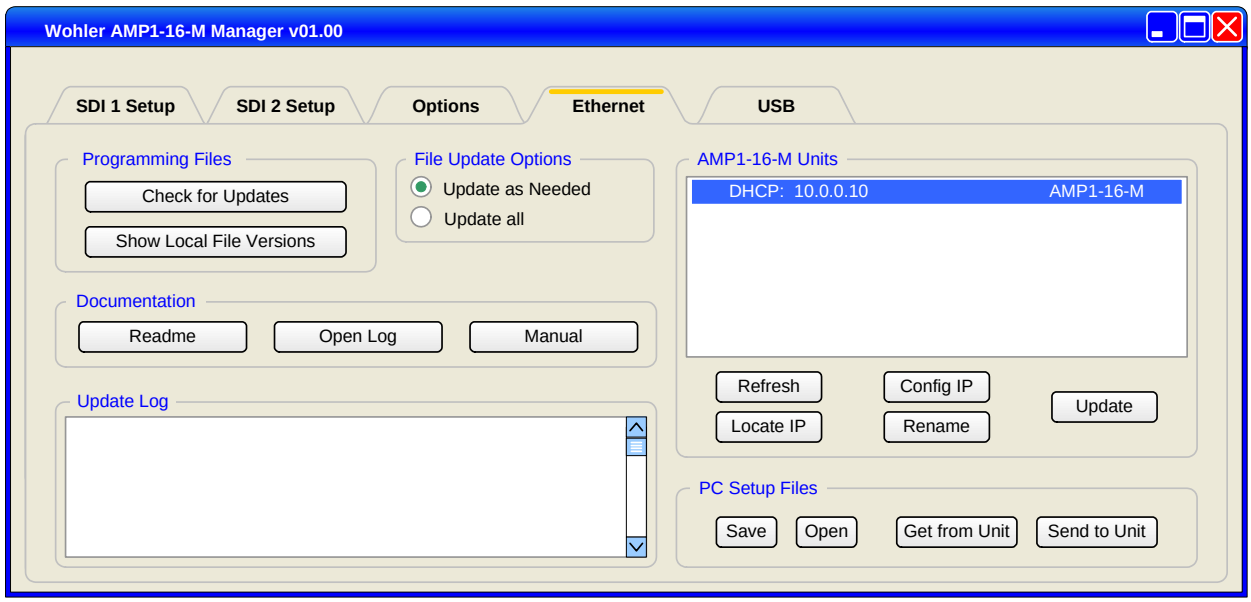
Upgrading the AMP1-16-M

Figure B–4 AMP1-16-M Manager SDI Ethernet Screen



1. To update the AMP1-16-M of your choice, click the one you want to update from the **AMP1-16-M Units** area.

2. Click **Update**.

   Note: The AMP1-16-M will discontinue its normal operation while the software update is taking place. This process may take several minutes after which the AMP1-16-M will restart.

Important: This concludes the AMP1-16-M software upgrade procedure.

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